

NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS  
UPPER MILLPOND DAM CT. (U) CORPS OF ENGINEERS WALTHAM  
MA NEW ENGLAND DIV 09 JAN 81

1/1

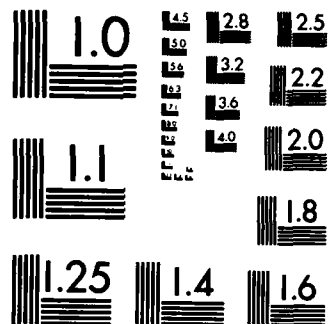
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UPPER MILLPOND DAM  
CT 00390

①

REPRODUCTION AT GOVERNMENT EXPENSE

AD-A144 699

INDIAN RIVER BASIN  
CLINTON, CONNECTICUT

DTIC FILE COPY

PHASE I INSPECTION REPORT  
NATIONAL DAM INSPECTION REPORT

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER  CT 00390	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle)  Upper Millpond Dam  NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS		5. TYPE OF REPORT & PERIOD COVERED  INSPECTION REPORT
7. AUTHOR(s)  U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DIVISION		6. PERFORMING ORG. REPORT NUMBER
9. PERFORMING ORGANIZATION NAME AND ADDRESS		8. CONTRACT OR GRANT NUMBER(s)
11. CONTROLLING OFFICE NAME AND ADDRESS DEPT. OF THE ARMY, CORPS OF ENGINEERS NEW ENGLAND DIVISION, NEDED 424 TRAPELO ROAD, WALTHAM, MA. 02254		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
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19. KEY WORDS (Continue on reverse side if necessary and identify by block number) DAMS, INSPECTION, DAM SAFETY, Indian River Basin Clinton, Connecticut		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The Upper Millpond Dam is located on the Indian River in Clinton, Connecticut. The overall length of the dam is 82.5 feet including a stone masonry spillway of 24.5 feet located near the left side. The dam is in fair condition with some cracking and spalling of the concrete cap, no functioning outlet workds, several large overhanging trees just upstream of the dam, measurable seepage around the left abutment and some misalignment of the stone masonry dam itself.		

*Philip W. Genovese and Associates, Inc.*  
*Consulting and Design Engineers*

January 9, 1981

Re: Upper Millpond Dam  
Clinton, Connecticut  
Contract # DACW -33-81-C0017

The Department of the Army  
New England Division  
Corps of Engineers  
424 Trapelo Road  
Waltham, Massachusetts 02154

Attention: Mr. E. P. Gould, Project Management Division

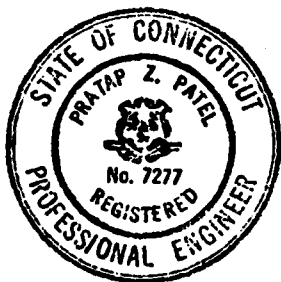
Gentlemen:

We have inspected Upper Millpond Dam and conducted a field survey of the site. Our dam failure analysis concludes that the dam should be reclassified as having a low hazard potential.

We are including with this letter a short report substantiating our conclusions.

Very truly yours,

PHILIP W. GENOVESE & ASSOCIATES, INC.



*Pratap Z Patel*  
Pratap Z. Patel, P.E.  
Project Manager



PZP/lh

Accession For	
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DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A/1	

295 Treadwell Street, Hamden, Conn. 06514 P. O. Box 4930

Telephone 288-5678 (203) Cable GENOPHIL

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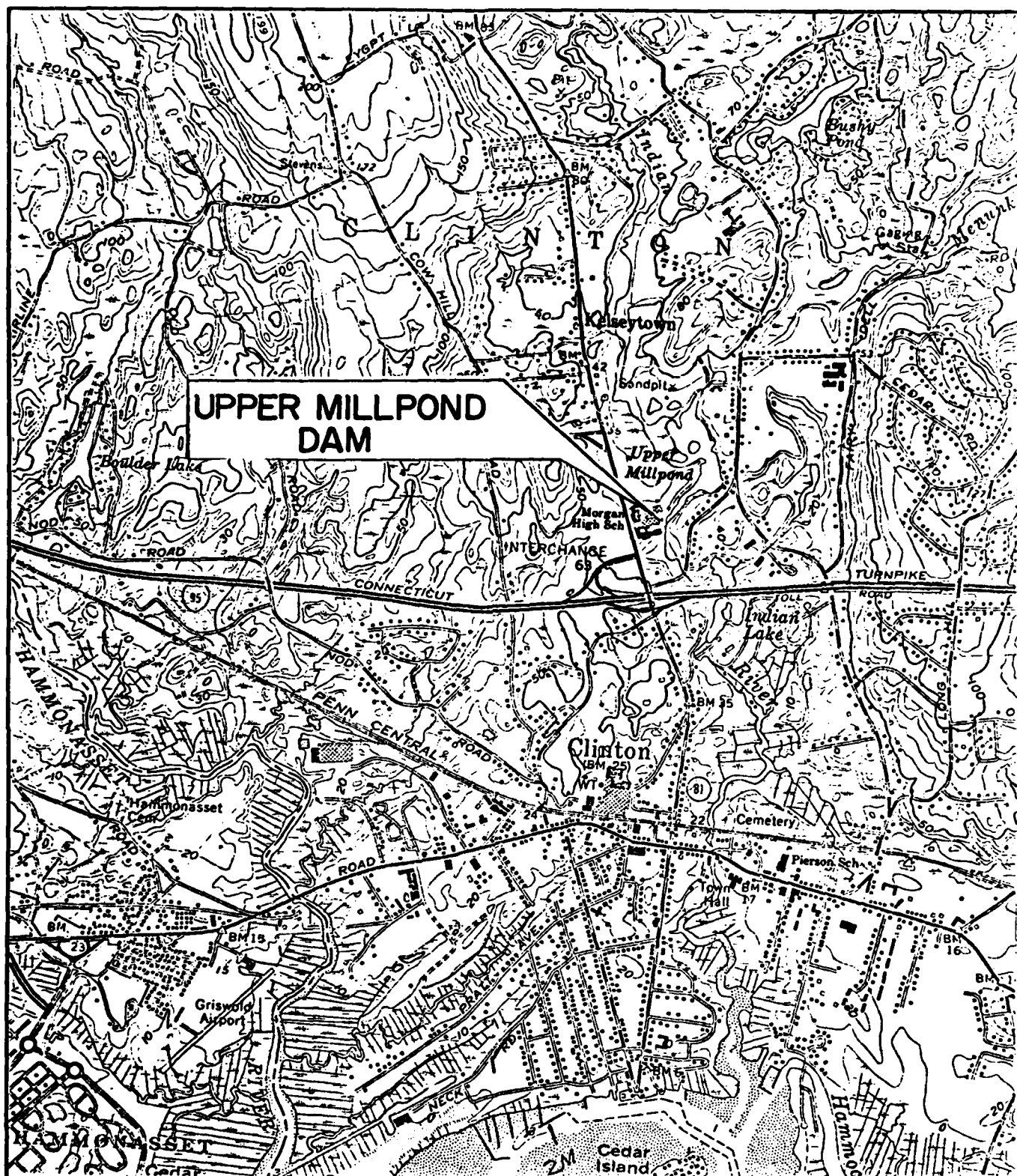
## DESCRIPTION

Name of Dam : Upper Millpond Dam  
Identification Number: CT 00390  
Town : Clinton  
County and State : Middlesex County, Connecticut  
Stream : Indian River  
Owner : Town of Clinton, Connecticut  
Date of Inspection : November 20, 1980

The Upper Millpond Dam is located on the Indian River in Clinton, Connecticut. The dam was constructed in 1813. The overall dam length is 82.5 feet including a stone masonry spillway of 24.5 feet located near the left side. There is a concrete cap, approximately 8 inches high by 1 foot wide which was added to the dam on either side of the spillway in 1975. On the right side of the dam is the remains of an outlet box which is partially collapsed. Also, located beneath the spillway is a plugged 10-inch metal outlet pipe. The maximum height of the dam is 8.2 feet and the average depth immediately behind it is 1 foot.

The dam is owned and operated by the Town of Clinton. The dam impounds Upper Millpond which is 16.5 acres in size and which is essentially a widened channel of the Indian River.

The dam is in fair condition with some cracking and spalling of the concrete cap, no functioning outlet works, several large overhanging trees just upstream of the dam, measurable seepage around the left abutment and some misalignment of the stone masonry dam itself.



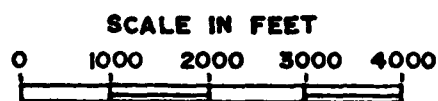
USGS QUAD  
CLINTON, CT.



PHILIP W. GENOVESE AND  
ASSOCIATES, INC.

ENGINEERS-HAMDEN, CT.

U.S. ARMY ENGINEER DIV.  
NEW ENGLAND  
CORPS OF ENGINEERS  
WALTHAM, MASS.



NATIONAL PROGRAM OF INSPECTION OF  
NON - FED DAMS  
LOCATION MAP





U.S. ARMY ENGINEER DIV.  
NEW ENGLAND  
CORPS OF ENGINEERS  
WALTHAM, MASS.

PHILIP W. GENOVESE AND  
ASSOCIATES, INC.  
ENGINEERS - HAMDEN, CT.

NATIONAL  
PROGRAM  
OF  
INSPECTION  
OF  
NON - FED  
DAMS

OVERVIEW PHOTO

DECEMBER, 1980

UPPER MILLPOND DAM

INDIAN RIVER

CLINTON,

CONNECTICUT

## HYDROLOGIC/HYDRAULIC EVALUATION

Upper Millpond Dam has a tributary drainage area of 6.55 square miles, a surface area of 16.5 acres at spillway height and a storage capacity of 39.6 acre-feet at spillway level and 56.1 acre-feet at the top of dam. The maximum height of the dam as measured from the stream bottom to the top of dam is 8.2 feet. In accordance with Table I of the Corps of Engineers Recommended Guidelines for Safety Inspection of Dams this dam is classified as "small" in size based on storage capacity.

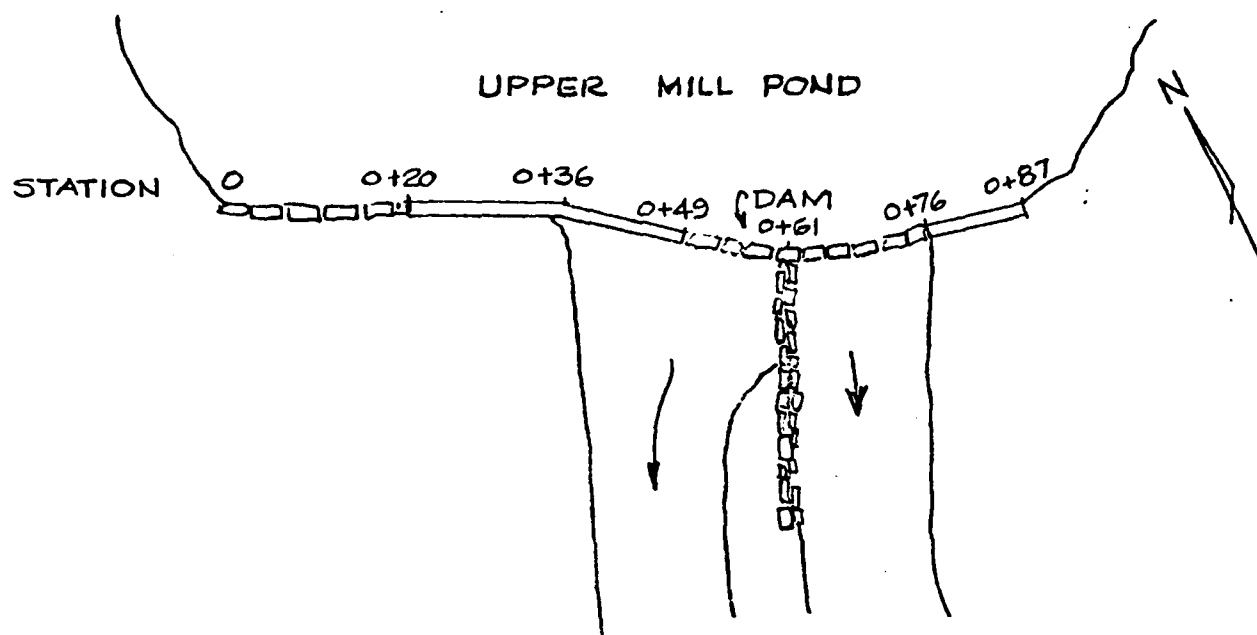
The spillway design flood of 1801 cfs (1/2 PMF) could not be passed through the dam without overtopping occurring. In this case it resulted in a surcharge of 3.0 feet as the spillway is only capable of passing 76 cfs before the dam is overtopped.

A dam breach analysis was made using the Corps of Engineers method of estimating the peak discharge from a breached dam. This resulted in a flow of 913 cfs. In this case rather than use the Corps of Engineers "Rule of Thumb" guidance for estimating downstream flood hydrographs we utilized the results of a detailed stream backwater analysis performed on this section of the Indian River. The analysis was completed in 1978 for the Clinton Flood Insurance Study (FIS) and is included as Reference 1. The use of these profiles will actually result in conservative flood heights as there is no accounting for channel storage and resultant decreases in peak discharges downstream of the dam. However, the conclusion that the profiles illustrate is that there is little chance of loss of life or economic damage from a dam breach. The floodwaters would be largely attenuated by a 6.4 acre pond 1600 feet downstream of the dam, along with a wetlands 5800 feet downstream of the dam.

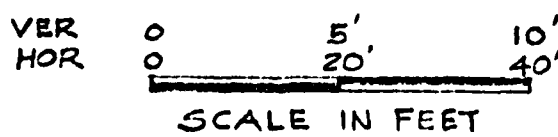
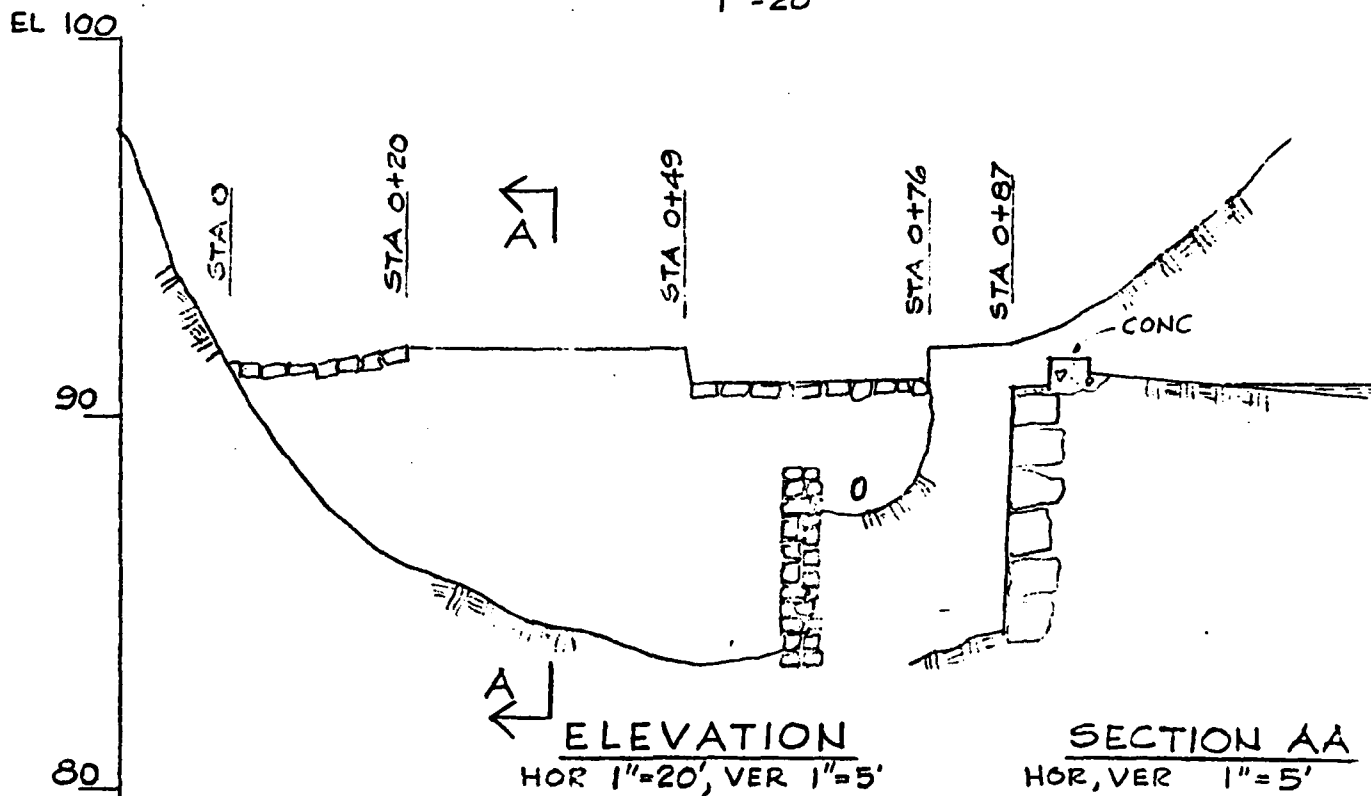
The calculations used in this analysis, including the pertinent sections of the Clinton FIS are included as Appendix D.

APPENDIX A

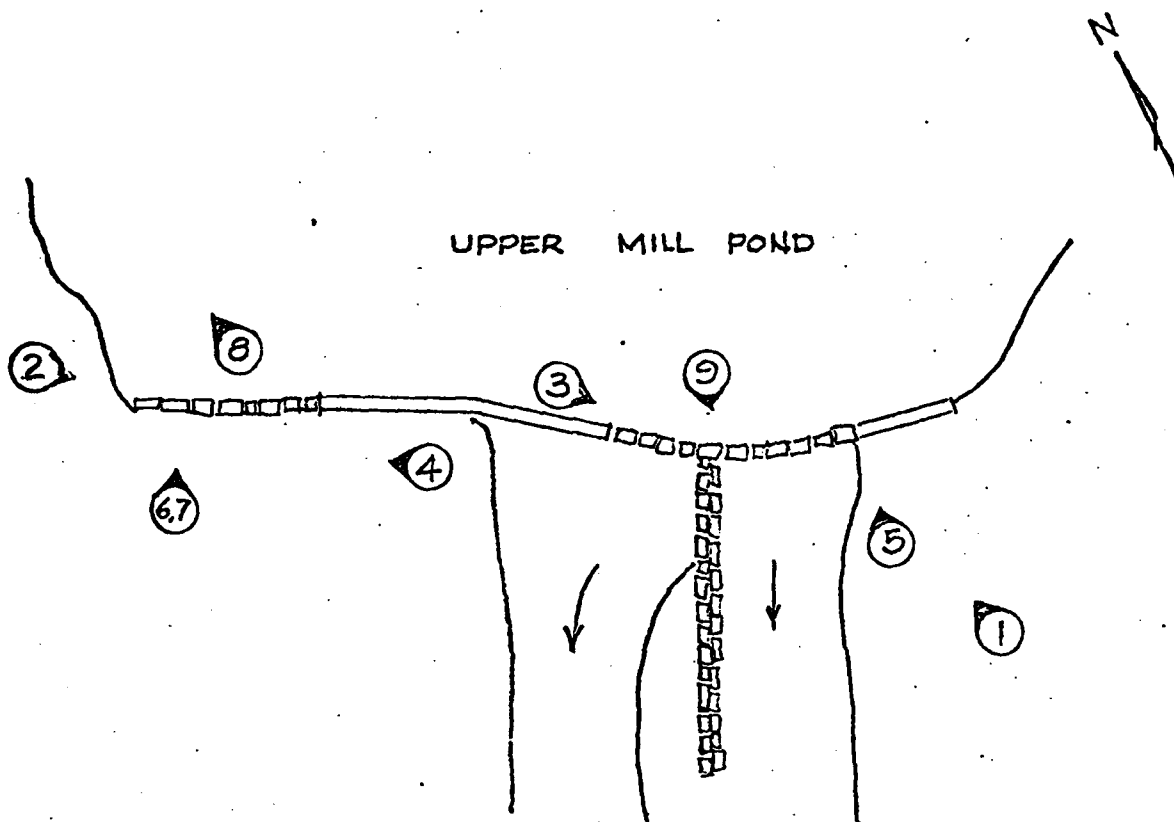
SITE PLAN



**PLAN**  
1"=20'



APPENDIX B  
SITE PHOTOGRAPHS



③

REFERS TO PHOTO NUMBER,  
LOCATION AND DIRECTION

U.S. ARMY ENGINEER DIV.  
NEW ENGLAND  
CORPS OF ENGINEERS  
WALTHAM, MASS.

PHILIP W. GENOVESE AND  
ASSOCIATES, INC.  
ENGINEERS - HAMDEN, CT.

NATIONAL  
PROGRAM  
OF  
INSPECTION  
OF  
NON-FED  
DAMS

PHOTO LOCATION PLAN

UPPER MILLPOND DAM

INDIAN RIVER

CLINTON,

CONNECTICUT



1. Panorama of downstream face of dam from left abutment.

2-2

PHILIP W. GENOVESE & ASSOCIATES, INC.  
ENGINEERS                      HAMDEN, CONNECTICUT

UPPER MILLPOND DAM (CT00390)



2. Crest of dam from right abutment.

3. Spillway looking towards left abutment.



B-3





4. Downstream face of dam taken from about Sta 0+50 looking toward right abutment.



5. Junction of dam and left abutment.

B-4



6. Water seeping through downstream face of dam at about Sta 0+15. Ruler extended 5 feet.



7. Large opening in downstream face of dam at about Sta 0+25. Opening is about 3-ft-wide and 1.5-ft-high and extends about 3 feet into the dam.

B-5



8. Overhanging Tree on Right upstream bank.



9. Sluiceway downstream of dam from the crest of the dam looking downstream.

APPENDIX C  
INVENTORY FORM

STATE	DIVISION	COUNTY	CONTRACT	NAME	LATITUDE	LONGITUDE	REPORT DATE
CT	390	NED	CT 007 02	UPPER MILLPOND DAM	41°17'5"	72°31'7"	14 JAN 81

POPULAR NAME	NAME OF IMPOUNDMENT
	UPPER MILLPOND

REGION	RIVER OR STREAM	NEAREST DOWNSTREAM CITY-TOWN-VILLAGE	DIST FROM DAM (MI.)	POPULATION
01 07	INDIAN RIVER	CLINTON	1	11,200

TYPE OF DAM	YEAR COMPLETED	PURPOSES	HYDRAULIC HEIGHT (FT.)	IMPOUNDING CAPACITIES (ACRE-FT.)
NT	1813	R	8	56
			1-0	54
			7	40
			4	44

DIST OWN FED R PRV/FED SCS A VER/DATE  
NED

REMARKS
20-ESTIMATE 21-MASONRY

D/S	SPILLWAY	MAXIMUM DISCHARGE (CFS)	VOLUME OF DAM (CY)	POWER CAPACITY (KW)	INSTALLED PROPOSED	NO. OF NAVIGATION LOCKS
24.5	M	2	76			

OWNER	ENGINEERING BY	CONSTRUCTION BY
TOWN OF CLINTON		

DESIGN	CONSTRUCTION	REGULATORY AGENCY	OPERATION	MAINTENANCE

INSPECTION BY	INSPECTION DATE	DAY	MO	YR	AUTHORITY FOR INSPECTION
PW GENOVESE & ASSOC, INC.	20	NOV	80		

REMARKS

APPENDIX D

HYDROLOGIC/HYDRAULIC CALCULATIONS



CLINTON HARBOR

D.A.  
Wheeler  
Rock

Hammock Pt  
10

Kelsey  
Point

3.6

12

6

PROJ. NO. 804107  
DESCRIPTION Upper Millpond Dam  
Glenn Ct. H&H

GENOVESE AND ASSOCIATES  
CONSULTING ENGINEERS  
HAMDEN, CONN.

SHEET NO. 1 OF 12  
BY WTC DATE 12/9/80  
CHKD. BY \_\_\_\_\_ DATE \_\_\_\_\_

D-1

## UPPER MILLPOND DAM -

### SIZE classification -

Top of Dam = 24.97 (Spwy = 23.97)  
D/S Low Point = 16.77  
Height of Dam = 8.2

Reservoir Area @ Spillway Elevation  
is 16.5 Acres. Estimated storage volume  
@ top of dam elevation is:

$$V = \frac{1}{3} \times b \times h + b \times h$$

$$V = \frac{1}{3} \times 16.5 \times 7.2 + 16.5 (1)$$

$$V = 56.1 \text{ AC-FT}$$

From COE Table 1  $\rightarrow$  this is a SMALL dam

### Hazard Classification -

Based upon the existence of a  
trailer park downstream along with an  
interstate highway we will initially  
assume a significant classification.

Based upon a SMALL size and  
significant hazard classification we  
will use a 100 to  $\frac{1}{2}$  PMF for  
the Spillway Design Storm.

Preliminary calculations of  $\frac{1}{2}$  PMF  
for this site are:  
FLAT, CONCRETE  $Q = \frac{1}{2} (550 \text{ cfm/MI}^2) (6.55 \text{ MI}^2) = 1801 \text{ CFS}$

An examination of the Flood Insurance Study

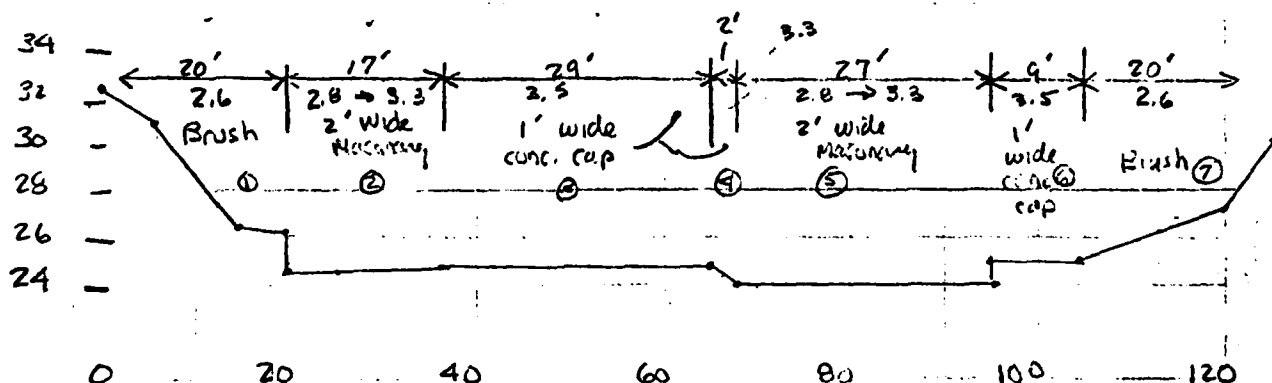


D-2

done for Clinton indicates a 100 yr. flood flow just d/s of the dam site of 1057 CFS and a 500 yr. flood flow of 1421 CFS. Therefore a  $\frac{1}{2}$  PMF of 1201 CFS seems reasonable. The volume of the  $\frac{1}{2}$  PMF is

$$\frac{1}{2} \left( \frac{14''}{12''} \right) (6.55 \text{ mi}^2) (640 \text{ AC/mi}^2) = 3219 \text{ AC-FT}$$

This same Flood Study has stream profiles for the 10, 50, 100 & 500 year floods on the Indian River. We have plotted the dam rating curve figures from the report onto semi-log paper on page 3 and projected the expected elevation for a  $\frac{1}{2}$  PMF. We have then checked these results against our rating curve shown below and find they compare favorably.



Elev.	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	H <sub>4</sub>	H <sub>5</sub>	H <sub>6</sub>	H <sub>7</sub>	Q <sub>1</sub>	Q <sub>2</sub>	Q <sub>3</sub>	Q <sub>4</sub>	Q <sub>5</sub>	Q <sub>6</sub>	Q <sub>7</sub>	Q <sub>TOT</sub>
26	-	1.3	1.1	1.6	2	1	-	-	71	117	13	214	31	-	446
28	1.2	3.3	3.1	3.6	4	3	1.8	24	326	554	45	713	169	57	1893

Sheet No. 3 of 12

D-3

radius  
center  
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29

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35

D-4

Our conclusion then is that the dam will be overtopped for the  $\frac{1}{2}$  PMF.

### Short cut routing -

$$Q_p = 1801 \text{ CFS} \Rightarrow \text{elev} = 28.1 \text{ MSL}$$

$$\text{stor.} = 107.2 \text{ AC-FT}$$

$$\begin{aligned} \text{stor} &= \frac{1}{3}(b)(h) + b \times h \\ &= \frac{1}{3}(16.5)(7.2) + 16.5(4.1) \\ &= 107.2 \text{ AC-FT} \end{aligned}$$

$$\frac{107.2 \text{ AC-FT}}{6.55 \text{ MI}^2 (640 \text{ AC/MI}^2)} \times \frac{12''}{\text{FT}} = 0.31'' \text{ of runoff}$$

$$Q_p = Q_p \left(1 - \frac{\text{stor}}{\frac{19''}{2}}\right)$$

$$Q_p = 1801 \left(1 - \frac{.31}{9.5}\right) = 1742 \text{ CFS}$$

$\therefore$  Elev 28.0' (negligible difference)

### DAM BREACH ANALYSES

$$Q_{p1} = \frac{8}{27} (0.4) W_b \sqrt{g} Y_o^{3/2}$$

$$Q_{p1} = \frac{8}{27} (0.4) (160) \sqrt{32.2} (8)^{3/2}$$

$$Q_{p1} = 913 \text{ CFS}$$

This flow is almost identical to the FIS 50 year storm of 897 cfs for which we already have a detailed flood routing (pages 5 & 6). In addition we have graphed these results against our own field sections (p. 9 & 8) and find them to be in close agreement. Preliminary evaluation of structures on a USGS map along with a field inspection indicates there is little chance of loss of life. Pages 9-12 re-evaluate this situation.

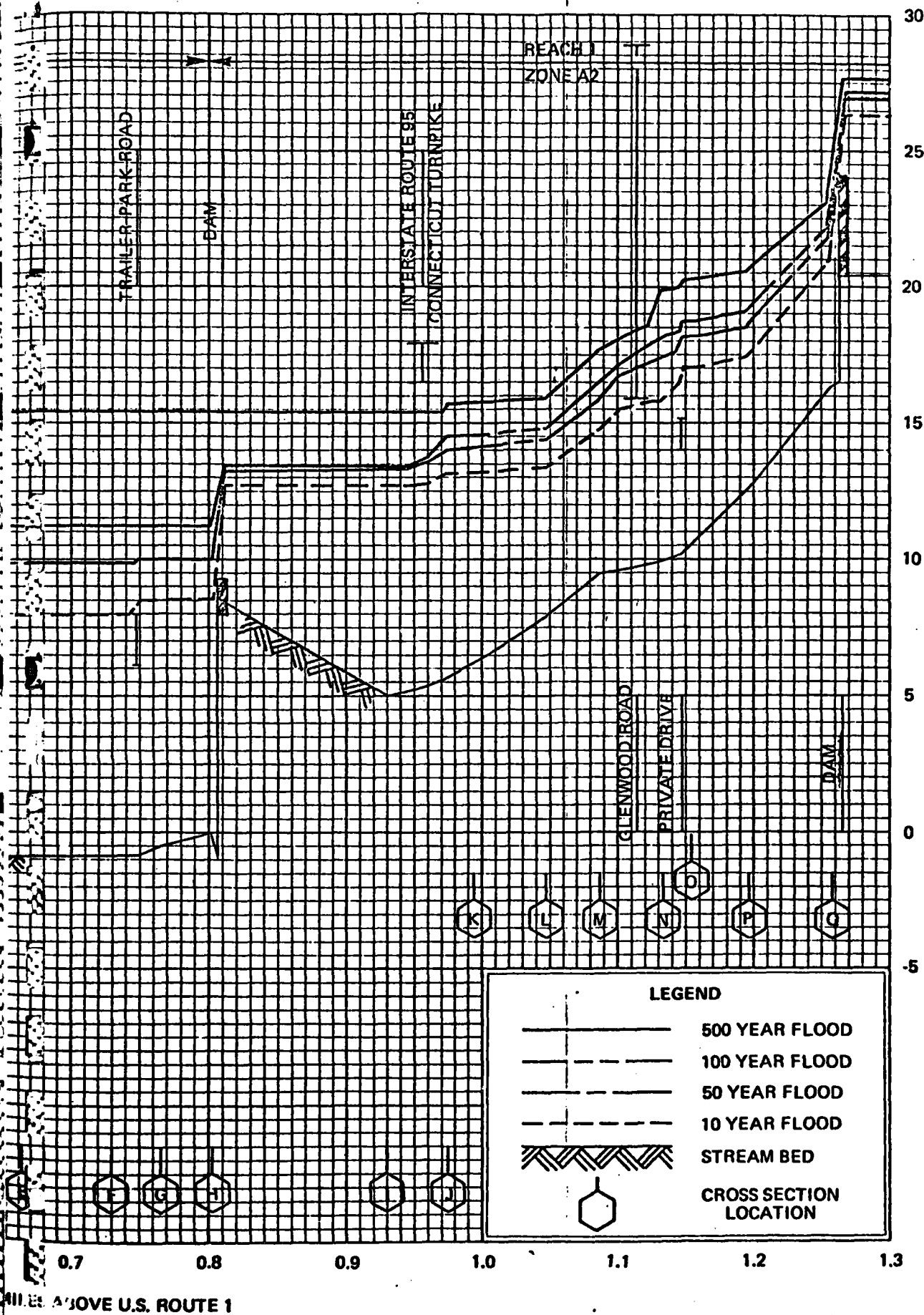
The Regional Frequency Method was used to compute all peak discharges (Reference 5). Due to the inherent possibility of a large standard error in the Regional Frequency Method, comparative computations of discharges by the rainfall-runoff technique based on the Synthetic Triangular Unit Hydrograph and the SCS Methodology were also utilized for assisting in the adoption of discharges for various frequencies in a smooth curve (References 6 and 7).

Peak discharges were similarly computed for the Hammonasset River and compared with peak discharges published in the Flood Insurance Study for the adjacent Town of Madison (Reference 8). To maintain uniformity in the Flood Insurance Studies from one community to another, and since the computed discharges compared favorably to the upstream published discharges, the published discharges were adopted for use. These discharges were adjusted downstream of Madison by a method developed by the SCS utilizing a discharge-area relationship (Reference 9).

A summary of drainage area-peak discharge relationships for the streams studied by detailed methods is shown in Table 1, "Summary of Discharges." Figures 2 through 7 show the potential 100- and 500-year flood levels on detailed study streams in Clinton.

TABLE 1 - SUMMARY OF DISCHARGES

<u>FLOODING SOURCE AND LOCATION</u>	<u>DRAINAGE AREA</u> <u>(sq. miles)</u>	<u>PEAK DISCHARGES (cfs)</u>			
		<u>10-YEAR</u>	<u>50-YEAR</u>	<u>100-YEAR</u>	<u>500-YEAR</u>
MENUNKETESUCK RIVER					
At Westbrook/Clinton corporate limits	15.22	1,166	1,706	1,940	2,597
Downstream of confluence with Plane Brook	13.98	1,100	1,610	1,830	2,450
Downstream of confluence with Carter Hill Brook	13.27	1,061	1,553	1,765	2,363
At Kelseytown Road	10.70	913	1,336	1,519	2,033
HAMMONASSET RIVER					
At Boston Post Road	47.13	2,500	3,700	4,300	5,600
At Interstate Route 95	43.86	2,393	3,542	4,116	5,360
At Madison/Killingworth corporate limits	39.97	2,261	3,346	3,888	5,064
INDIAN RIVER					
At Boston Post Road	7.53	680	1,010	1,190	1,600
At Glenwood Road	6.41	604	897	1,057	1,421
At Hurd Bridge Road	5.58	544	78	952	1,280



FLOOD PROFILES

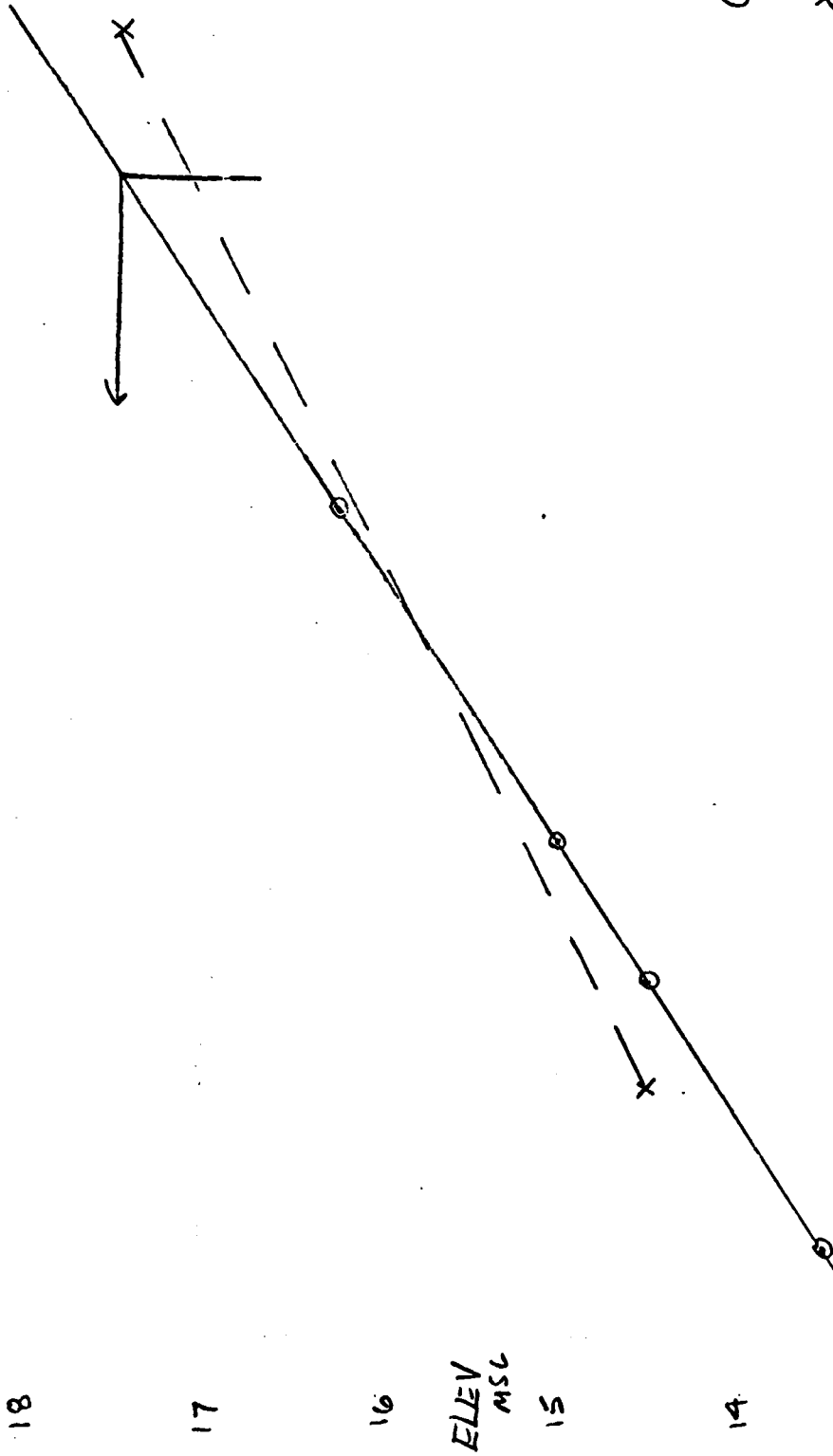
INDIAN RIVER

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT  
Federal Insurance Administration

TOWN OF CLINTON, CT  
(MIDDLESEX CO.)

09P

X SECTION ≈ 300' AS OF  
CLEUNUX ROAD



○ FIS Comps

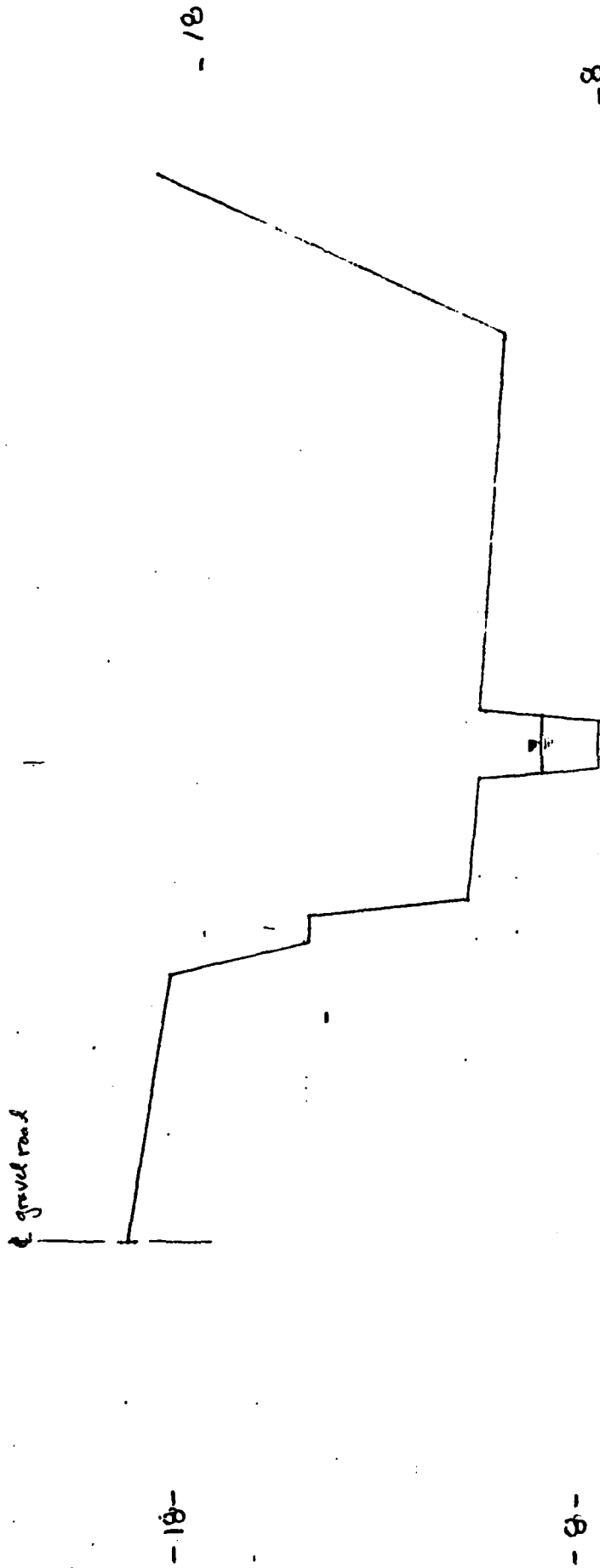
X GFA Comps

Q CFS

PROJ. NO. 80410  
 DESCRIPTION WATER MILL Pond Dam  
Clinton, CT

GENOVESE AND ASSOCIATES  
 CONSULTING ENGINEERS  
 HAMDEN, CONN.

SHEET NO. 10 OF 12  
 BY T. J. G. DATE 12/1/77  
 CHKD. BY J. F. DATE 12/1/77



SECTION THROUGH STREAM

Scale: Horz. 1" = 40'-0"  
 Vert. 1" = 4'-0"

Note: Mobile Home Slob is  
 at elevation 18.0 MSL

Check  $Q_{14.5} = \frac{1.49}{.09} (660) \left( \frac{660}{180} \right)^{2/3} \left( \frac{1}{1976} \right)^{1/2}$   
 $Q_{14.5} = 777 \text{ CFS}$   
 Check  $Q_{17.5} = \frac{1.49}{.09} (1200) \left( \frac{1200}{200} \right)^{2/3} \left( \frac{1}{1426} \right)^{1/2}$   
 $Q_{17.5} \approx 1966 \text{ CFS}$   
 (  $Q_{17.5}$  from p. 4 is 1800 cfs )

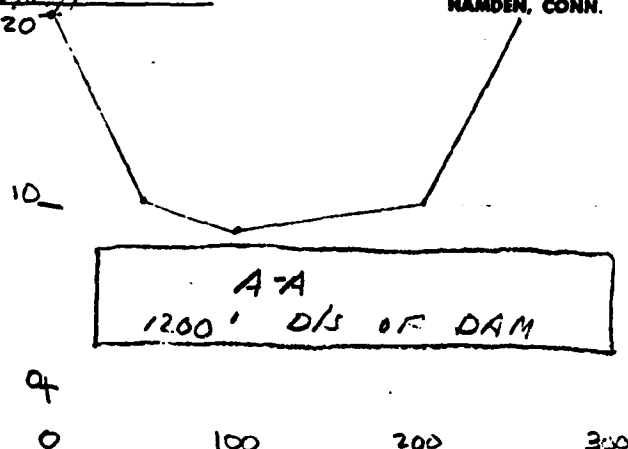
D-8

PROJ. NO. P-407  
 DESCRIPTION Upper Millpond Dam  
Clinton, Conn.

GENOVESE AND ASSOCIATES  
 CONSULTING ENGINEERS  
 HAMDEN, CONN.

SHEET NO. 9 OF 12  
 BY WSTG DATE 12-23-53  
 CHKD. BY \_\_\_\_\_ DATE \_\_\_\_\_

D-9



$$Q = \frac{1.49}{n} a r^{2/3} S^{1/2}$$

$$Q = \frac{1.49}{.075} a r^{2/3} (.084)$$

$$n = .075$$

$$S = \frac{17 - 8.5}{1200} = .0071$$

$$S^{1/2} = .084$$

$$Q = 1.67 a r^{2/3}$$

ELEV	A	P	R	$R^{2/3}$	Q
8.5	0	0	0	0	0
10.0	112.5	150	0.75	0.825	155
11.0	267.5	160	1.67	1.41	630
12.0	431.5	168	2.57	1.88	1355

$$Q_p = 913 \text{ CFS}$$

$$\text{ELEV} = 11.4$$

$$\text{Area} = 331.5 \text{ FT}^2$$

$$Q_0 = 76 \text{ CFS}$$

$$\text{ELEV} = 9.25$$

$$\text{Area} = 56 \text{ FT}^2$$

$$\text{Vol} = \frac{(331.5 - 56) \text{ FT}^2 (1200) \text{ FT}}{43,560 \text{ FT}^2/\text{Ac}} = 7.6 \text{ AC-FT}$$

$$Q_p = 913 \left( 1 - \frac{7.6}{56.1} \right)$$

$$Q_p = 789 \text{ CFS}$$

$$\text{ELEV} = 11.25$$

$$\text{Area} = 303.5$$



D-10

$$V = \frac{(303.5 - 56)(1200)}{43,560} = 6.8$$

$$Q_p = 913 \left( 1 - \frac{7.6 + 6.8}{(2)56.1} \right) = 796 \text{ cfs}$$

$$\text{Elev} = 11.23$$

$$\text{Stor} = 43.9$$

Rating curve for d/s dam indicates to pass a flood of 715 cfs it requires an elevation of 12.8. This indicates there are at least 24.3\* acre-feet of storage in the area behind the dam. In order to determine the most realistic elev./storage behind the dam we applied the Corps' short cut routing procedure as follows.

$$Q_{p1} = 796 \text{ cfs}$$

$$\text{Elev} = 12.8$$

$$\text{Stor} = 24.3 \text{ AC-FT}$$

$$* (12.8 - 9.0)(6.4) = 24.3$$

Now if this <sup>storage</sup> occurs the peak outflow from the dam would be something less than 796 cfs due to the storage/attenuation capabilities of the pond. Specifically:

$$Q_{p2} = 796 \left( 1 - \frac{24.3}{48.9} \right) = 400 \text{ cfs}$$

$$\text{which results in: Elev} = 11.2$$

$$\text{Stor} = 11.2 - 9.0 (6.4) = 19.1$$

$$Q_{p3} = 796 \left( 1 - \frac{(24.3 + 19.1)/2}{48.9} \right)$$

$$\text{Stor}_{\text{avg}} = 19.2$$

$$Q_{p3} = 483 \text{ cfs}$$

$$\text{Elev} = 11.6$$

$$\text{Stor} = 48.9 - 19.2 = 29.7 \text{ AC-FT}$$

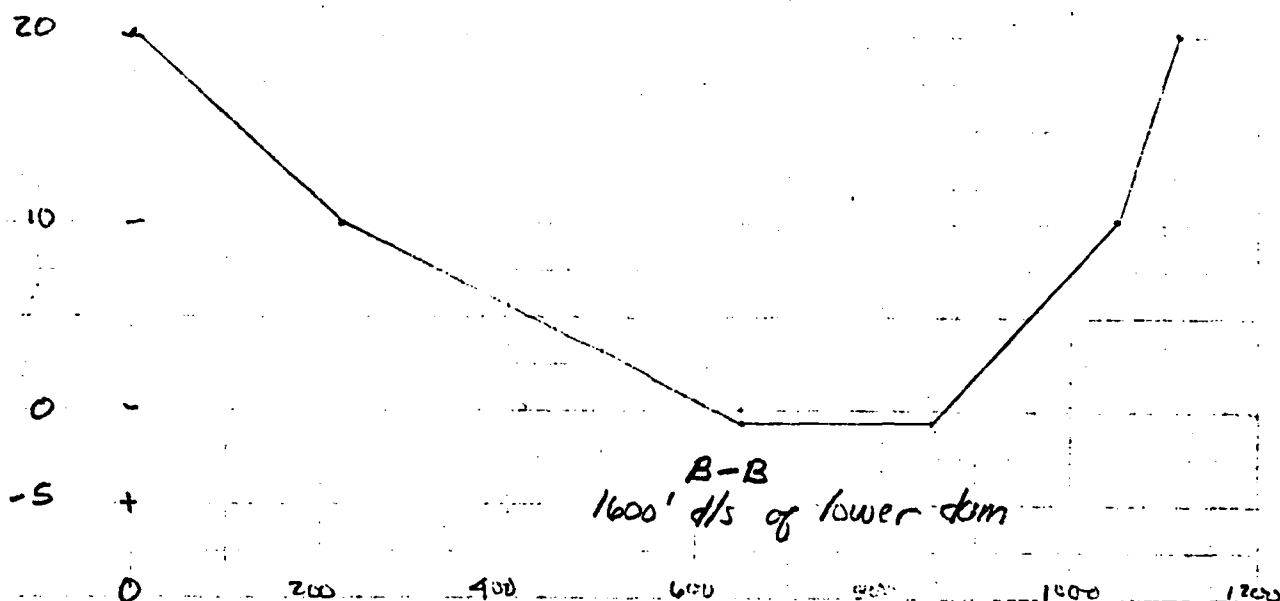
PROJ. NO. B04107  
 DESCRIPTION Upper Millpond Dam  
Clinton, Conn.

GENOVESE AND ASSOCIATES  
 CONSULTING ENGINEERS  
 HAMDEN, CONN.

SHEET NO. 11 OF 12  
 BY WJS DATE 12-23-71  
 CHKD. BY \_\_\_\_\_ DATE \_\_\_\_\_

D-11

Note: The Clinton FIS has a 10 yr, peak discharge of 680 cfs<sup>here</sup>. The outflow from the lower dam is 983 cfs. At no point d/s of this dam is the flood profile shown above 8.5 msl and even that elevation is due principally to tidal backwaters and not the flood discharge. Only one house in the next 2500' is at an elevation of 10.0 or below. Also a large wetland area starts approximately 1000' d/s of this dam. We will take a section 1600' d/s of this dam which should reflect the further decrease in peak discharge due to the wetlands storage capabilities.



$$Q = \frac{1.49}{n} A R^{2/3} S^{1/2}$$

$$Q = 0.62 A R^{2/3}$$

$$\eta = .06$$

$$\Delta = \frac{1}{1600} = .0006$$

$$D^{1/2} = .025$$

Elev	A	P	R	R <sup>2/3</sup>	Q
-1					0
5	1850	530	3.49	2.31	2650
2.5	1032	380	2.71	1.95	1248

PROJ. NO. B04107  
DESCRIPTION Upper Millpond Dam  
Clinton County

GENOVESE AND ASSOCIATES  
CONSULTING ENGINEERS  
HAMDEN, CONN.

SHEET NO. 12 OF 12  
BY WJG DATE 12/1/77  
CHKD. BY \_\_\_\_\_ DATE \_\_\_\_\_

D-12

$$\begin{array}{ll} Q = 483 & Q_0 = 76 \\ \text{Elev} = 0.35 & \text{Elev} = -0.8 \\ \text{Area} = 400 \text{ FT}^2 & \text{Area} = 63 \text{ FT}^2 \end{array}$$

$$\text{Vol} = \frac{(400 - 63)(1600)}{43,560} = 12.4$$

$$Q_p = 483 \left( 1 - \frac{12.4}{29.7} \right) = 281$$

$$\begin{array}{l} \text{Elev} = -0.2 \\ \text{Area} = 232 \end{array}$$

$$\text{Vol} = \frac{(232 - 63)(1600)}{43,560} = 6.2$$

$$Q_p = 483 \left( 1 - \frac{(12.4 + 6.2)/2}{29.7} \right) = 332 \text{ cfs}$$

$$\text{Elev} = 0.0$$

Conclusion: There is minimal chance of economic or loss of life from the breach of the Upper Millpond Dam. Even if it is high tide there will be no flooding caused by the breach of the Upper Millpond Dam due to the large wetland area (> 50 acres) which would only increase the elevation of the tidal area 0.5', to  $\approx$  4.0 MSL. Again this would be unlikely to cause any loss of life or economic damage due to the absence of property at this elevation.

APPENDIX E

VISUAL CHECK LIST WITH COMMENTS

VISUAL INSPECTION CHECK LIST  
PARTY ORGANIZATION

PROJECT UPPER MILL POND DAM

DATE: November 20, 1980

TIME 1300

WEATHER P. Cloudy, 45°F.

W.S. ELEV. \_\_\_\_\_ U.S. \_\_\_\_\_ DN. \_\_\_\_\_

PARTY:

- |                                   |           |
|-----------------------------------|-----------|
| 1. <u>Walt Gancarz - Genovese</u> | 6. _____  |
| 2. <u>Ed Nielsen - Genovese</u>   | 7. _____  |
| 3. <u>R. Murdock - GEI</u>        | 8. _____  |
| 4. <u>S. Whiteside - GEI</u>      | 9. _____  |
| 5. _____                          | 10. _____ |

PROJECT FEATURE	INSPECTED BY	REMARKS
1. <u>Embankment</u>	<u>All</u>	
2. <u>Outlet Structure</u>	<u>All</u>	
3. <u>Spillway</u>	<u>All</u>	
4. _____		
5. _____		
6. _____		
7. _____		
8. _____		
9. _____		
10. _____		

# PERIODIC INSPECTION CHECK LIST

PROJECT UPPER MILL POND DAM

DATE November 20, 1980

PROJECT FEATURE Dam Embankment

NAME WG, RM, SW

DISCIPLINE Geotechnical, Hydraulic,  
Civil/Str.

NAME \_\_\_\_\_

AREA EVALUATED	CONDITIONS
<u>DAM EMBANKMENT</u>	No embankment - stone masonry dam.
Crest Elevation	91.8
Current Pool Elevation	91.2
Maximum Impoundment to Date	
Surface Cracks	Concrete cap at about Sta 0+52 has spalled in some areas.
Pavement Condition	No pavement.
Movement or Settlement of Crest	At Sta 0+15, Sta 0+25 to Sta 0+35 and at Sta 0+78, some blocks have moved downstream and downward. At Sta 0+15 a stone has apparently fallen out of an old sluiceway.
Lateral Movement	Fair.
Vertical Alignment	Poor.
Horizontal Alignment	Fair.
Condition at Abutment and at Concrete Structures	Fair.
Indications of Movement of Structural Items on Slopes	None observed.
Trespassing on Slopes	N/A
Sloughing or Erosion of Slopes or Abutments	None observed.
Rock Slope Protection - Riprap Failures	No riprap observed.
Unusual Movement or Cracking at or near Toes	None observed.
Unusual Embankment or Downstream Seepage	Water flowing through downstream face of dam at Sta 0+15, Sta 0+30 and Sta 0+78.
Piping or Boils	None observed.
Foundation Drainage Features	None observed.
Toe Drains	None observed.
Instrumentation System	None observed.
Vegetation	A 2.5-ft-diameter tree is growing 8 ft. downstream of dam near the right abutment and is leaning over the dam.

# PERIODIC INSPECTION CHECK LIST

PROJECT UPPER MILL POND DAM DATE November 20, 1980  
 PROJECT FEATURE Dike Embankment NAME \_\_\_\_\_  
 DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<p><u>DIKE EMBANKMENT</u></p> <p>Crest Elevation</p> <p>Current Pool Elevation</p> <p>Maximum Impoundment to Date</p> <p>Surface Cracks</p> <p>Pavement Condition</p> <p>Movement or Settlement of Crest</p> <p>Lateral Movement</p> <p>Vertical Alignment</p> <p>Horizontal Alignment</p> <p>Condition at Abutment and at Concrete Structures</p> <p>Indications of Movement of Structural Items on Slopes</p> <p>Trespassing on Slopes</p> <p>Sloughing or Erosion of Slopes or Abutments</p> <p>Rock Slope Protection - Riprap Failures</p> <p>Unusual Movement or Cracking at or near Toes</p> <p>Unusual Embankment or Downstream Seepage</p> <p>Piping or Boils</p> <p>Foundation Drainage Features</p> <p>Toe Drains</p> <p>Instrumentation System</p> <p>Very on</p>	<p>No dike embankment.</p>

# PERIODIC INSPECTION CHECK LIST

PROJECT UPPER MILL POND DAM

DATE November 20, 1980

PROJECT FEATURE Outlet Works - Intake

NAME \_\_\_\_\_

DISCIPLINE \_\_\_\_\_

NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<p><u>OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE</u></p> <p>a. Approach Channel</p> <p>Slope Conditions</p> <p>Bottom Conditions</p> <p>Rock Slides or Falls</p> <p>Log Boom</p> <p>Debris</p> <p>Condition of Concrete Lining</p> <p>Drains or Weep Holes</p> <p>b. Intake Structure</p> <p>Condition of Concrete</p> <p>Stop Logs and Slots</p>	<p>Under water - not observed.</p>



# PERIODIC INSPECTION CHECK LIST

PROJECT UPPER MILL POND DAM

DATE November 20, 1980

PROJECT FEATURE Outlet Works - Control Tower NAME \_\_\_\_\_

DISCIPLINE \_\_\_\_\_

NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<p><u>OUTLET WORKS - CONTROL TOWER</u></p> <p>a. Concrete and Structural</p> <p>    General Condition</p> <p>    Condition of Joints</p> <p>    Spalling</p> <p>    Visible Reinforcing</p> <p>    Rusting or Staining of Concrete</p> <p>    Any Seepage or Efflorescence</p> <p>    Joint Alignment</p> <p>    Unusual Seepage or Leaks in Gate Chamber</p> <p>    Cracks</p> <p>    Rusting or Corrosion of Steel</p> <p>b. Mechanical and Electrical</p> <p>    Air Vents</p> <p>    Float Wells</p> <p>    Crane Hoist</p> <p>    Elevator</p> <p>    Hydraulic System</p> <p>    Service Gates</p> <p>    Emergency Gates</p> <p>    Lightning Protection System</p> <p>    Emergency Power System</p> <p>    Wiring and Lighting System</p>	<p>None observed.</p>

# PERIODIC INSPECTION CHECK LIST

PROJECT UPPER MILL POND DAM

DATE November 20, 1980

PROJECT FEATURE Outlet Works - Conduit

NAME \_\_\_\_\_

DISCIPLINE \_\_\_\_\_

NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<p><u>OUTLET WORKS - TRANSITION AND CONDUIT</u></p> <p>General Condition of Concrete</p> <p>Rust or Staining on Concrete</p> <p>Spalling</p> <p>Erosion or Cavitation</p> <p>Cracking</p> <p>Alignment of Monoliths</p> <p>Alignment of Joints</p> <p>Numbering of Monoliths</p>	<p>None observed.</p>

# PERIODIC INSPECTION CHECK LIST

PROJECT UPPER MILL POND DAM

DATE November 20, 1980

PROJECT FEATURE Outlet Works - Str./Channel

NAME \_\_\_\_\_

DISCIPLINE \_\_\_\_\_

NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<p><u>OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL</u></p> <p>General Condition of Concrete</p> <p>Rust or Staining</p> <p>Spalling</p> <p>Erosion or Cavitation</p> <p>Visible Reinforcing</p> <p>Any Seepage or Efflorescence</p> <p>Condition at Joints</p> <p>Drain holes</p> <p>Channel</p> <p>Loose Rock or Trees Overhanging Channel</p> <p>Condition of Discharge Channel</p>	<p>10" Metal Pipe below spillway is clogged, not working.</p>

# PERIODIC INSPECTION CHECK LIST

PROJECT UPPER MILL POND DAM

DATE November 20, 1980

PROJECT FEATURE Outlet works - Weir

NAME WG, RM, SW

DISCIPLINE Geotechnical, Hydraulic, Civil/Str.

NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<u>OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS</u>	
a. Approach Channel	Under water, not observed.
General Condition	
Loose Rock Overhanging Channel	
Trees Overhanging Channel	Two large ( 1' dia.) trees 100' u/s of dam.
Floor of Approach Channel	
b. Weir and Training Walls	
General Condition of Masonry	Fair
Rust or Staining	
Spalling	
Any Visible Reinforcing	
Any Seepage or Efflorescence	
Drain Holes	None observed.
c. Discharge Channel	
General Condition	Fair.
Loose Rock Overhanging Channel	Some large boulders and stones in walls overhanging channel.
Trees Overhanging Channel	Large trees overhanging channel.
Floor of Channel	Boulders and fallen trees in channel.
Other Obstructions	A long embankment separates the channe into a spillway channel to the right and a sluiceway to the left. The floor of the sluiceway is about 4 feet above the floor of the spillway channel. The two channel join about <u>400</u> feet down stream of the dam

# PERIODIC INSPECTION CHECK LIST

PROJECT UPPER MILL POND DAM DATE November 20, 1980  
 PROJECT FEATURE Outlet Works- Service Bridge NAME \_\_\_\_\_  
 DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<u>OUTLET WORKS - SERVICE BRIDGE</u> a. Super Structure Bearings Anchor Bolts Bridge Seat Longitudinal Members Under Side of Deck Secondary Bracing Deck Drainage System Railings Expansion Joints Paint b. Abutment & Piers General Condition of Concrete Alignment of Abutment Approach to Bridge Condition of Seat & Backwall	None observed.

